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Feature Article - Trade-Weighted Index: Method of Calculation

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The trade-weighted index (TWI) for the Australian dollar is an indicator of movements in the average value of the Australian dollar against the currencies of our trading partners. The TWI is shown in Table 8.6 ‘Exchange Rates’ on page 85 of Australian Economic Indicators (AEI) and is constructed by the Reserve Bank of Australia (RBA). The TWI is receiving increased attention given some sharp movements in exchange rates in the past year. This article reprints important information about the weights used in, and the construction of, the TWI which has been published in the RBA Bulletin.

The following information is reprinted below:

- RBA Media Release, published in its October 1997 Bulletin announcing the revised weights used for countries in the TWI; and
- RBA Press Release, published 10 years ago in its October 1988 Bulletin - which is reprinted here as it explains the way the TWI is calculated. The calculation method has not changed since then.

The RBA ‘Article of General Interest’ Alternative Measures of the Effects of Exchange Rate Movements on Competitiveness, published in its January 1998 Bulletin, is planned to appear in the next issue of AEI (April 1998) - it focuses on the potential implication of exchange rate movements for prices and the international competitiveness of countries that trade with East Asia. In particular, the RBA notes in the article that differences in alternative exchange-rate indices -

‘...can become significant when there are sharp divergences between movements in the bilateral rates, as has been the case recently. In these conditions, any single indicator of exchange-rate competitiveness is likely to become less useful, and it becomes more important to look carefully at a range of alternative indicators.’ (RBA Bulletin, January 1998; planned to be reprinted in the next issue of AEI, April 1998)

Contact details for the RBA are provided under ‘Further information’ at the end of this article.

Revised weights (Source: RBA October 1997)

Following is an edited version of the media release dated 30 September 1997 published in the October 1997 RBA Bulletin, announcing the revised weights used for countries in the TWI for the Australian dollar.

The Bank has revised the weights used for currencies in the trade-weighted index (TWI) for the Australian dollar. The revisions, which take effect from 1 October 1997, allow for changes in the country mix of Australia’s trade during 1996-97. (The new weights are listed in the table; the

previous weights are shown in brackets.

TRADE-WEIGHTED INDEX: REVISED WEIGHTS(a)

Currency	Trade-weight (per cent)	
Japanese yen	17.962	(19.5667)
United States dollar	16.2446	(15.9286)
New Zealand dollar	6.9162	(6.5824)
South Korean won	6.7668	(6.3983)
Chinese renminbi	5.4598	(5.5947)
UK pound sterling	5.2845	(5.5357)
New Taiwan dollar	4.3069	(4.3324)
Singapore dollar	4.2186	(4.4302)
German mark	3.9374	(4.3231)
Indonesian rupiah	3.6225	(3.0859)
Malaysian ringgit	2.9571	(2.8157)
Hong Kong dollar	2.8021	(2.8998)
Italian lira	2.5644	(2.5253)
Thai baht	2.0273	(1.9962)
French franc	1.9487	(1.8632)
Canadian dollar	1.7124	(2.0264)
PNG kina	1.6493	(1.6224)
Indian rupee	1.4501	(1.2436)
Swedish krona	1.204	(1.3054)
Belgian franc	1.1802	(1.0222)
Philippine peso	1.056	(0.9575)
UAE dirham	1.028	-
South African rand	1.0084	(0.8662)
Netherlands guilder	0.9831	(1.0028)
Saudi Arabian riyal	0.9158	(0.9503)
Swiss franc	0.7938	(1.1250)

(a) The new weights are shown in column 2 and the previous weights are shown, in brackets, in column 3.

The TWI is based on a sufficient number of currencies of our trading partners to give at least 90 per cent coverage of Australia's two-way merchandise trade. Based on 1996-97 trade figures, this requires trade-weights for 26 countries, with the United Arab Emirates dirham being added to the basket of currencies.

Trends in the weights evident over the past few years have continued. The share of Australia's largest trading partner, Japan, declined further, accounting for 18 per cent of the index, down from 20 per cent a year ago and 23 per cent two years ago. In contrast, trade between Australia and other countries in the Asian region has continued to rise in importance, accounting for 43 per cent of the index, up from 42 per cent a year ago and 40 per cent two years ago.

Method of calculation (Source: RBA October 1988)

Following is an edited version of the press release dated 10 October 1988 published in the October 1988 RBA Bulletin, explaining two technical changes to the calculation of the TWI. These are the most recent changes to the method used to calculate the TWI.

Since its introduction in September 1974, the method used to calculate the TWI has been largely unchanged. An arithmetic average has been used and the weights have been based on trade shares of all trading partners. The Bank has made two technical changes to the calculation of the TWI. The two changes are:

- to use a geometric average, rather than arithmetic average, to calculate the index. International practice currently favours the geometric average;
- to base the TWI on a sufficient number of currencies of our trading partners to give at least

90 per cent coverage of Australia's trade (export plus imports). For 1987-88 trade figures, this requires currencies of twenty-four countries (Editor's Note: For 1996-97, this requires currencies of twenty-six countries, see 'Revised weights' above). Previously, the weights covered twenty groups of trading partners; countries with relatively small trade shares were combined with one or other of the countries with a relatively large trade share. The new method gives similar results but is much simpler.

These two changes are effective from 3 October 1988. The TWI values calculated by the new method will be spliced onto the previous series for the TWI as at 30 September thus ensuring that there is no discontinuity in the series.

Weighting Scheme

A geometric average is to replace the arithmetic average. The new averaging procedure is summarised in the box at the bottom of this page.

This change will bring the Bank's method into line with current international practice. It will also remove a source of slight upward bias in the TWI. Under the arithmetic averaging procedure, changes in currencies that rose against the Australian dollar had a reduced impact on the TWI as it moved from its base, while changes in currencies that fell against the Australian dollar had an increased impact. This upward bias is of little importance for day-to-day or month-to-month movements in the TWI, but its effects tend to cumulate. For example, between end-December 1983 and end-June 1988, the published TWI fell by around 26%. Had a geometric average been used, it is estimated that the TWI would have shown a decline of around 28% over that period.

Trade weights

TRADE-WEIGHTED INDEX: NEW AVERAGING PROCEDURE

$$TWI_t = \left[\frac{\$A_t}{\$A_0}\right]^{W_1} \times \left[\frac{E_{2,t}}{E_{2,0}} \times \frac{\$A_t}{\$A_0}\right]^{W_2} \times \ldots \times \left[\frac{E_{24,t}}{E_{24,0}} \times \frac{\$A_t}{\$A_0}\right]^{W}$$

$$= \left[\frac{E_{2,t}}{E_{2,0}}\right]^{W_2} \times \ldots \times \left[\frac{\$A_t}{E_{24,0}}\right]^{W_{24}} \times \frac{\$A_T}{\$A_0} \times TWI_0$$

Where:

W_1	=	weight of US dollar
W_i	=	weight of foreign currency i (i=2,..24)
E_i	=	units of foreign currency i per US dolar (i=2,..24)
$A	=	units of US dollars per Australian dollar
0	=	base period
t	=	current period

Coverage of Australia's trade is to be slightly narrowed. To date the trade share of each of

Australia’s minor trading partners was added to the weight of one of the 19 largest trading partners (or the Special Drawing Right) with which it could be most appropriately grouped. The TWI was thus based on trade-weights for 20 groups of countries. For much of the 1970s and early 1980s, many countries retained some form of formal link with major currencies and it was possible to group countries in a systematic way. However, as exchange rate regimes have become more diverse and flexible, the grouping of countries in recent years has become more difficult.

Under the revised method, the weights are calculated on the basis of trade shares of countries which, in total, account for at least 90% of Australia’s trade. On 1987-88 trade figures, the new index comprises trade-weights for twenty-four countries (Editor’s Note: For 1996-97, the TWI comprises trade-weights for twenty-six countries, see ‘Revised weights’ above). This number may vary in the future with changes in the direction of Australian trade.

The new TWI has been spliced onto the previous TWI as at 30 September 1988 to ensure continuity in the series. The base remains May 1970 = 100.

Further information

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